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SEEDLING GROWING APPARATUS
[USTROYSTVO DLYA VYRASHCHENIYA RASSADY]

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TITLE (54) : SEEDLING GROWING APPARATUS

FOREIGN TITLE [54A] : USTROYSTVO DLYA VYRASHCHENIYA
RASSADY

The invention concerns agriculture, in particular an apparatus for growing vegetable crops, and may be used most effectively in mass production greenhouses.

There is known to be an apparatus for growing seedlings (see patent RU 2028041, IPC A 01 G 9/10, published 19950209), containing regular hexagonal cells, formed by interconnected strips of synthetic material. Each strip contains a ferromagnetic in the amount of 80-90 % by weight in order to lend it residual magnetization.

One disadvantage of this apparatus is the laboriousness of using it, since the entire container is intended to be used for transplanting the plant grown, which is very inconvenient for mass production, since it significantly increases the work time and labor cost, which leads, consequently, to an increase in the cost of the work for growing seedlings.

There is also known to be an apparatus for growing seedlings in greenhouses (see patent RU 2056728, IPC A 01 G 9/02, published 19960327), containing a box-like housing, the cover of which contains conical cells for seedlings held by means of stoppers, the bottom of which cells are connected with elements for transplanting. The surface of the elements for transplanting is conical, in addition the elements are arranged coaxial with the cells and are interconnected into a unit, and the unit is connected with the cover by catches mounted in their stoppers.

However, the design of this device is complicated, and it has a large number of elements. The design is inconvenient to use, since it

provides for a special connection of the cell unit, having elements for transplanting, with the cover of the housing, which is very labor-consuming. By increasing the productivity of utilization of the greenhouse area in this way, in practice the device worsens the biological and agricultural conditions of growing seedlings, since the stems may be injured when the plants are removed from the unit. In addition, the small dimensions of the cells limit the development of the root system of the seedlings.

An arrangement for growing seedlings (see USSR Inventor's Certificate No. 1720566, IPC A 01 G 9/02, published 19920323), containing cells having an open throat, a bottom, and walls narrowing in the direction toward the bottom. The cells are connected with one another by stiffening ribs with the formation of a unit. The throat and bottom of each cell have an oval shape for directed formation of the root system of the plants.

However, the design of the device does not provide for the presence of drainage openings, which leads to root rot and the appearance of different infectious diseases. In addition, in mass production of seedlings, such a criterion as the location of the earth ball with the plant roots with the major axis of the oval across a row cannot always be maintained.

The invention is intended to solve the task of creating a light, simple, convenient to use, and reusable apparatus for growing seedlings with improvement of the biological and agricultural characteristics of seedlings.

This object is achieved by the fact that in the apparatus for growing seedlings, containing identical cells, connected with one another by rigid ribs, forming a unit and having an open neck, a bottom, and side walls narrowing toward the bottom, the cells and rigid ribs are made of plastic, and an opening is made in the bottom of each of the cells, the ratio of the dimensions of the neck to the dimensions of the opening amounts to no more than 2:1, and the angle of inclination of the cell walls to the bottom is no less than 60°.

The sources of patent and scientific-technical literature known to the authors do not describe a simple, light, convenient to use, and reusable device for growing seedlings, which would provide all of the necessary agricultural growing conditions by means of using cells and rigid ribs made of plastic, providing for the formation of a unit of cells identical to one another with an open neck and openings in the bottom of each cell.

There are known to be devices with openings in the bottom of the cells (see, for example, US patent No. 4586288, IPC A 01 G 9/02, US patent No. 5274953, IPC A 01 G 9/02). However, their role reduces to drainage. They are not intended to be used to push on the earth ball with the root system in order to remove the plants.

In addition, in the known devices, rigidity is achieved by using special pans, housings, and covers (see, for example, US patent No. 5210975, IPC A 01 G 9/02, Japanese application No. 5-51249, IPC A 01 G 9/02, RU patent No. 1831258, IPC A 01 G 9/00).

In the design claimed, rigidity is achieved by creating special plastic stiffening ribs, to which the cells, also made of plastic, are made.

Thus, the lack of knowledge of a rigid design of a device with plastic cells, simple, light, and convenient to use, intended to be reused, and contributing to the effective growth and development of seedlings, makes it possible to conclude the presence of an "inventive level".

The invention is explained with drawings, where Fig. 1 shows the apparatus claimed, in a top view, and Fig. 2 in a side view.

The device contains plastic cells, connected with one another by means of stiffening ribs 1, also made of plastic. The cells have an open neck 2, bottom 3, and side walls 4 narrowing in the direction toward the bottom. Openings, the dimensions of which are in a ratio of 1:2 to the dimension of the neck. The walls 4 are inclined to the bottom 3 at an angle of no less than 60°.

The apparatus works in the following way.

The cells are filled with soil and the seeds are planted. Grown seedlings are removed from the cells by pushing on the earth ball through the opening 5, thus pushing the entire plant through the neck 2 for its further growth in pots or in open ground.

The experimentally determined ratio of the dimensions of the neck of the cells to the opening in the bottom of the cells, and also the angle of inclination of the walls, make it possible to efficiently disperse seedlings in the apparatus and to prevent them from elongation.

In the case of cell neck dimensions from 4.5 x 4.5 cm to 5 x 5 cm optimal illumination of the sprouts is provided, which contributes to their normal vegetative development. In the case of angles of inclination of less than 60°, the design of the device become inconvenient to use and is not compact. In addition, the normal development of the root system is disturbed.

The cells and stiffening ribs are made of low-pressure, high-density polyethylene in accordance with All-Union State Standard 16338-85, grade 277-73.

The lightness and compactness of the device makes it easy to be installed in greenhouses, and also convenient to transport, without using special attachments for this. The optimal number of cells with which one person can easily transport and move the apparatus is 49 (with rows placed 7 in a row).

The device does not require the use of special housings and trays. The dimensions of the openings are determined experimentally so that the soil does not fall out of the cells.

The apparatus is hygienic since it is easily washed, which contributes to the prevention of infectious diseases of plants.

The rigidity of the designs makes it possible to protect the plant roots, the absence of deformations of stems, the effective growth, and development of seedlings, and also all necessary agricultural growth conditions.

Formulation of Invention:

A device for growing seedlings, containing identical cells, connected with one another by stiffening ribs with the formation of a unit and having an open neck, a bottom, and walls narrowing toward the bottom, distinguished by the fact that the cells and stiffening ribs are made of plastic, and in the bottom of each cell there is an opening, the ratio of the dimensions of the neck and dimensions of the opening amounting to no more than 2 : 1, and the angle of inclination of the cell walls to the bottom amounting to no less than 60°.

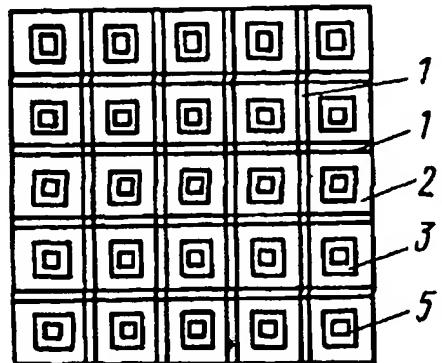


Figure 1

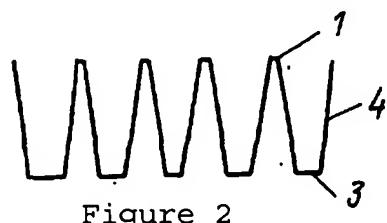


Figure 2